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Director



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DEPARTMENT OF ECOLOGY

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January 5, 1990

Mr. Dean Fowler  
Colbert Landfill Project Manager  
Spokane County Public Works  
811 North Jefferson Street  
Spokane, Washington 99260-0180

RE: Comments on Colbert Landfill Phase I Pilot Well Plan

Dear Dean:

Ecology and EPA have reviewed the above stated plan, dated November 30, 1989, and we have the following comments on that plan.

General Comments

The Plan doesn't adequately address the existing data collected during the Remedial Investigation/Feasibility Study and the current drilling effort. More documentation for the rational of the decisions made in the plan is needed.

Given that the data from the pilot well pump tests will be used to evaluate the hydrogeologic properties necessary for the design of the Phase II interception and extraction systems and that these pilot wells will supply ground water for treatability studies, careful consideration should be given to well location, well design, and the type of data collected during the pumping tests.

This plan does not describe the details necessary for EPA approval of construction and location of pilot wells and the pilot well pump tests. If Landau feels that they presently do not have sufficient site specific information to provide more details, then perhaps addenda to this work plan (subject to government approval within a specified time interval) should be provided for each area at a later date. These addenda could include more detailed descriptions of well locations, and pump test specifics.

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Specific Comments

CHAPTER 2.0 PILOT WELL CONSTRUCTION

Page PW-2-3 (Section 2.1 Well Construction Procedures)

1. The use of vertical distribution of contaminants in the aquifer to establish screen intervals is valid. However, there is no discussion of how this is to be accomplished. This needs to be clarified.
2. The identification of wells anticipated to pump at less than 75 gallons per minute should be provided and justified.
3. More information should be provided on the pumping equipment. Will variable rate pumps be used or how will the flow rate be controlled?

Figures PW-2.3 and PW-2.4

There are no sand packs indicated in the well construction diagrams. This should be justified with respect to the following:

1. the increased potential for clogging of the screens, and resulting decrease in well efficiency;
2. the potential for pump damage which could result from pumping sediment;
3. the estimated lifetime of these pumping wells, given the fact that the SOW states that they may potentially be incorporated into the phase II extraction system;
4. the incremental up-front increase in cost associated with installing sand packs and grout in these wells which could prevent potential well and pump degradation over the long run.

Page PW-2-5

The statement, "Screen design . . . , using geohydrologic data collected from the nearest phase I monitoring well(s)" needs to be justified. The variability in lithology between the nearest monitor well and the pilot well could be significant depending upon the distance between the wells. If no sand packs are being installed, it is important to base the screen selection on grain size analysis of samples from the pilot wells themselves. This will aid in minimizing the problems mentioned above.

Page PW-2-5 (2.1.1 South System)

The 18 foot grout seal should be a high solids mixture if in a contaminated soils. In other words a high yield bentonite mixture may not protect against migration of organic compounds.

Page PW-2-10 (Section 2.2 Well Development)

Air lift pumping and development are acceptable techniques, however, I am concerned about developing a well with only 10 to 30 percent submergence. Larry Beard informs me, development under these conditions will only be used where the orifice is above the screened portion of the well. Under these conditions this is acceptable.

An Imhoff cone is an excellent tool to use during development. It allows one to quantify the suspended solids content quickly in the field.

Page PW-2-12 (Section 2.3 Disposal Procedures for Soil Cuttings and Excess Ground Water)

The disposal of excess ground water within the landfill refuse disposal area may create a problem due to the potential generation of landfill leachate. Please quantify the volume of water which may be generated during drilling/development/sampling of the monitor wells which may be disposed of in the landfill. Is there a location within the landfill boundary where water could be disposed of which is not above garbage? Relatively small volumes of water disposed of at the landfill may not create a problem, but many thousands of gallons of water discharged above the garbage is not an acceptable approach.

Chapter 3.0 PUMPING TESTS

Page PW-3-1

The SOW requires "...water level monitoring will be conducted in at least the 2 closest monitor wells..." during pump testing, with more wells incorporated at the discretion of the County. I strongly recommend that the County incorporate more monitor wells during the pump tests, if at all possible. This would provide useful information on boundary conditions, and aquifer heterogeneity that could be important in designing the pump and treat systems.

Page PW-3-1 (Section 3.1 Test Set-Up)

The usefulness of preliminary step drawdown pump tests must be addressed, especially for the south system where there is potential for significant drawdown during the constant rate test. A step drawdown test could sufficiently stress the aquifer to determine an

effective pumping rate for the constant rate test. Step drawdown testing will also provide information on whether the pumping rates identified in the SOW are reasonable. A step drawdown test shouldn't take longer than 5-6 hours followed by a 24 hour aquifer rest period. This could be accomplished during the test start-up stage (section 3.2.4) which already incorporates a 24 hour rest period.

Page PW-3-2 (Section 3.1 Test Set-up)

Although the general conditions are acceptable, the following should be considered. Before the pumping portion of any aquifer test is terminated, the data should be field plotted and evaluated. Too many times, this is not done and significant changes occur late in the test. These changes often require additional pumping time to determine the magnitude of the boundary conditions.

Page PW-3-3

How will anticipated well efficiency and available drawdown be determined without step drawdown tests?

Page PW-3-4 (Section 3.2 Test Operation)

I strongly recommend continuous long term monitoring prior to the actual aquifer test. Past experience dictates such phenomenon as barometric pressure, recharge events, river stage, etc. can have significant effects on ground water levels. If prior monitoring indicated this type of interference then corrective measurements can be taken during the actual test.

Page PW-3-4 (Section 3.2.1 Water Level Measurements)

The timing of the water level measurements is critical. I have used 1, 2, 3, 4, 5, 7, 10, 15, 20, 30, 45, 60, 75, 90, 105, 120, 150 minutes, hourly, and reducing the frequency to twice daily after the first day. What do you plan on using for your water level measurement timing?

Page PW-3-6 (Section 3.2.2 Discharge Measurements)

If the discharge should vary more than 5% the test may have to be shut down and restarted after the well is allowed to recover. In any event, Ecology and EPA should be notified as soon as possible.

Page PW-3-6 (Section 3.2.3 Test Duration)

The duration of the test should be a function of the test after the seven day minimum as eluded to above. Justification for the duration of the pump tests needs to be provided.

Mr. Dean Fowler  
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If you have any questions regarding the above comments, please give me a call at (206)438-3043. I look forward to receiving the revised final Phase I Pilot Well Plan.

Sincerely,

*Mike Blum*

Mike Blum, Project Manager  
Landfill Site Cleanup Section  
Hazard Waste Investigations  
and Cleanup Program

MB:clr

cc: Neil Thompson, EPA  
Susan McCarthy, EPA  
Larry Beard, Landau Associates